

Relative Incidence of Pulmonary Emphysema among Negroes and Whites of Both Sexes*

EDWARD S. RAY

Department of Medicine, Medical College of Virginia, Richmond

A striking clinical feature of emphysema is its predominance among white males, and its relative infrequency among Negro females. This is true, at least in the state of Virginia, as shown by recent figures of death rates from the disease (table 1).

To further evaluate the incidence of this disease, the records of patients at the Medical College of Virginia were reviewed. Included in this study were hospital and clinic admissions for the years 1961 and 1962, and private outpatients seen during the years 1960, 1961, and 1962. The MCV hospitals admit approximately 35,000 patients yearly with a ratio of 51% white and 49% Negro. The out-patient clinics admit about 90,000 patients annually with a ratio of 28% white and 72% Negro.

The criteria for making a diagnosis of emphysema were: shortness of breath as a major complaint, generalized suppression of breath sounds and expiratory wheezing, a 1-second forced expiratory volume of less than 70% of the total vital capacity, and x-ray evi-

dence of limited motion and depression of the diaphragms. Only patients fulfilling these criteria, but showing no evidence of other lung diseases, were included in this study (370).

Smoking Habits

The great majority of the patients (315) gave a history of cigarette smoking (table 2). The sex and race distribution of these figures (table 3) almost parallels that of death rates from the disease. The data on smoking habits of these patients could not be evaluated accurately as the habit varied in individuals from year to year, and some patients had difficulty in recalling accurately their precise smoking habits over the years. Some individuals tended to underestimate the number of years they had been smoking, and some had reduced their smoking in recent years because of progressive respiratory symptoms. Of the 315 patients with emphysema, most had smoked for 30 years or longer (table 4). A great majority of these patients smoked a package or more of cigarettes daily (table 5). Thus there appears to be a correlation between the degree and duration of cigarette smoking and the incidence of significant pulmonary emphysema.

Cigarette Smoking among General Hospital and Clinic Patients

Because of the marked differences in the incidence of emphysema according to sex and race, differences in the smoking habits of these groups were examined. A survey was made of the smoking habits of patients on the general hospital wards and in the Out-Patient Clinic. Only patients who were 40 years of age or older were included, as a pattern of smoking is not usually developed before this age. A total of 600 individuals were interviewed, 150 of each sex and race (table 6). There was a significant difference in the smoking habits of the two sexes and a smaller difference between the two races; white males being the heaviest smokers, followed by Negro males and white females ($p < 0.01$ for each combination); Negro females smoked the least. These differences in smoking habits correspond to the difference in frequency of emphysema between the two sexes, but do not explain the greater difference in incidence between white and Negro males. Possibly the population selection was biased, as only clinic and hospital patients were interviewed. Possibly also other factors, such as occupation or host reaction, are important.

* Presented at the 1964 Stoneburner Symposium.

TABLE 1

Deaths from Emphysema in Virginia According to Sex and Race*

Sex and Race	1959	1960	1961	1962
Male, white.....	106	148	188	230 (75%)
Male, Negro.....	14	19	21	25 (7%)
Female, white.....	10	22	30	48 (16%)
Female, Negro.....	1	1	1	5 (2%)

* Data of the State Bureau of Vital Statistics.

TABLE 5

Intensity of Smoking among 315 Patients with Emphysema

Daily Consumption of Cigarettes	No.	Percentage of Total
10	0	0
10-20	6	2
20-30	181	57
30	128	41

TABLE 2

Smoking History of 370 Patients with Pulmonary Emphysema

Smoking Habits	No.	Percentage of Total
Cigarette smokers.....	315	85
Pipe and cigar smokers..	5	1
Smoking not recorded...	42	12
Nonsmokers.....	8	2

TABLE 6

Smoking Habits in Four Patient Samples (150 each) from the General Hospital and Clinic Population, Separated by Sex and Race

Daily Cigarette Consumption	No. of Patients*			
	Male, white	Male, Negro	Female, white	Female, Negro
0†	17 (11)	16 (10)	73 (50)	93 (62)
1-20	22 (15)	52 (36)	32 (20)	36 (24)
>20	106 (71)	66 (44)	43 (30)	21 (14)
Pipe	1 (0)	8 (5)	2 (0)	0 (0)
Cigar	4 (3)	8 (5)	0 (0)	0 (0)

* Numbers in parentheses indicate the percentage of total in each group.

† Significantly more nonsmokers among females than among males ($p < 0.01$) regardless of race, but no significant difference between the two races in either sex.

TABLE 3

Sex and Race Distribution among 315 Patients with Emphysema Who were Smokers

Sex and Race	No.	Percentage of Total
Male, white.....	251	80
Male, Negro.....	25	8
Female, white.....	36	11
Female, Negro.....	3	1

TABLE 4

Duration of Cigarette Smoking in 315 Patients with Emphysema

Years of Smoking	No.	Percentage of Total
<10	0	0
10-20	2	1
20-30	36	11
30-40	110	35
>40	167	53

A factor influencing cigarette smoking among females is that they are more likely to become concerned about cough and expectoration than are men, and are therefore more likely to seek medical attention. In my own experience, men often tolerate a moderate amount of cough and expectoration for years without complaining and without seeking medical advice. This is especially true of men who are cigarette smokers who assume (and rightly) that such symptoms are related to their smoking. Women, on the other hand, try to avoid cough and expectoration and are more likely to smoke less to reduce these symptoms. This could explain, in part, the difference in the smoking habits between the two sexes. However, a sampling of a small number of females of both races under 40 years of age showed that cigarette smoking is commoner in this age group than in older women. One may expect, therefore, an increase in frequency of emphysema among females of both races during the next decade or two.

Summary

1. There is an apparent correlation between cigarette smoking and the incidence of pulmonary emphysema. An increased incidence of emphysema is associated with increased cigarette consumption. The disease is relatively infrequent in those who have smoked less than a pack of cigarettes daily for less than 20 years.

2. The low incidence of emphysema among females today may be explained by their low cigarette consumption. If this is true, this incidence should increase within the next decade because of cigarette consumption among today's younger females.

3. The incidence of emphysema is lower among Negro males than would be expected from their smoking habits alone.

Acknowledgment

Mrs. Rhoda W. Maddox of the scientific computer laboratory, department of biophysics, kindly assisted with the statistical examination. Her valuable assistance was possible through support from U. S. Public Health Service Research Grant FR 00016-03.